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1100 Seventeenth Street, N.W. Washington, D. C. 20036

SUBJECT: Trip Report - Symposium on Physiology
and Pathology of Sleep, Los Angeles,
California, May 22-23, 1968.
Case 710.

DATE: June 17, 1968

FROM: R. K. White

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MEMORANDUM FOR FILE

A symposium on the Physiology and Pathology of Sleep, under the auspices of the Department of Psychiatry and Brain Research Institute of the UCLA School of Medicine, was held at the Century Plaza Hotel in Los Angeles on May 22-23, 1968. A program of the symposium and list of participants is appended to this memorandum.

The material presented consisted largely of summary reviews of research familiar to those working in the area. However, some stimulating new findings were also presented, primarily by Feinberg, Clemente and Dement. The overall impression gained by the authors was that, while sleep research is one of the "hottest" areas in contemporary psychology and physiology, and much valuable and non-obvious data have been accumulated, much mystery about the sleep process and its function remains. Future research must connect sleep patterns with events and processes in the waking state. Although much of the work done has been interdisciplinary, considerable insularity from other behavioral and neurophysiological research and theory has existed. The blithe assumption that one can understand sleep without further comprehension of the waking brain becomes more and more dubious.

Feinberg organized a mass of data from his laboratory and the sleep literature to prove his contention that the changes in sleep patterns from early childhood to old age are the most dramatic known changes in the physiology of the brain. He also showed that the extent of increased insomnia and decreased stage 4 and REM* sleep that accompany old age are good predictors of the extent of decreased mental performance that is part of the senility syndrome.

Clemente connected Pavlov's internal inhibition theory (which views sleep onset as an active process) with

* Rapid Eye Movements accompany, and are used to physiologically define, what is commonly called dreaming.

N79-73003

(NASA-CR-95473) SYMPOSIUM ON PHYSIOLOGY AND
PATHOLOGY OF SLEEP, LOS ANGELES, CALIFORNIA,
MAY 22-23, 1968 TRIP REPORT (Bellcomm,
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brainstem and forebrain transection studies which have produced permanent sleep or wakefulness in animals. He also showed that sleep onset produced by forebrain electrical stimulation could be conditioned by Pavlovian procedures.

Dement presented evidence to indicate that the critical events occurring in REM sleep are phasic brain discharges which (in cats, at least) take the form of pontine-geniculate-occipital spikes in the EEG record. He showed that P-G-O spike deprivation in cats was much more effective than usual REM deprivation procedures in producing rebound effects and behavioral changes (hyperphagia, hypersexuality, and hyperaggressiveness).

Of more immediate interest to NASA were several papers supporting the growing case that physiological sleep patterns reflect organic abnormalities and can be used to predict behavioral disturbances. These papers include those of Kales, Snyder, Hartmann and Dement. Although much remains to be learned, especially about stress effects on the sleep patterns of normals (as opposed to mental patients), there is every indication that sleep monitoring can be a useful diagnostic and prognostic tool on long-duration space missions, with the added advantage that such monitoring does not infringe on operational time.

The authors talked informally with several of the participants about sleep monitoring and about the problems surrounding performance upon sudden awakening from sleep as they might impact on spaceflight mission planning.

Proceedings of the symposium will be published, and when they are, the authors will receive copies for those who might wish to peruse them.

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Attachment
"Physiology and Pathology of Sleep Symposium" program

PHYSIOLOGY AND PATHOLOGY OF SLEEP SYMPOSIUM

May 22-23, 1968 Century Plaza Hotel

PHYSIOLOGY OF SLEEP

Wednesday Morning 9-12:30 (Chairman: A. Rechtschaffen)

- 9:00 Welcome
J. D. FRENCH
- 9:10 Sleep and Dream Cycle
R. J. BERGER
- 9:35 Basic Rest-Activity Cycle in Relation to Sleep and Wakefulness
N. KLEITMAN
- 9:50 24 Hour Sleep Cycling
W. B. WEBB
- 10:10 Age and Sleep Patterns
I. FEINBERG
- 10:30 Coffee

Neurophysiology and Biochemistry of Sleep

- 10:50 Physiological Characteristics of Sleep
R. J. BERGER
- 11:10 Cortical Synchronization and the Onset of Sleep
C. D. CLEMENTE
- 11:30 Neurophysiologic and Biochemical Mechanisms of Sleep
M. JOUVET (Did not attend. Summary presented)
- 11:55-12:30 DISCUSSION - Panel

PATHOLOGY OF SLEEP

Wednesday Afternoon 2-5:30 (Chairman: E. D. Witzman)

- 2:00 Sleep Disorders of Children
A. JACOBSON
- 2:15 Narcolepsy and Hypersomnia
A. RECHTSCHAFFEN
- 2:30 Physiological Sleep Patterns in Organic Brain Disease
I. FEINBERG
- 2:50 Sleep Alterations Associated with Medical Illnesses
A. KALES
- 3:05 Laboratory Studies of Insomnia
A. RECHTSCHAFFEN
- 3:25 Coffee

Psychiatric Disorders and Sleep

- 3:45 Sleep Disturbance in Relation to Acute Psychosis
F. SNYDER
- 4:05 Mania, Depression and Sleep
E. HARTMANN
- 4:20 Sleep Disturbances in Schizophrenia
W.C. DEMENT (Combined with his 5/23 presentation)
- 4:40-5:30 DISCUSSION - Panel
- 5:30-6:30 COCKTAIL PARTY (Reception for all attending symposium
hosted by Hoffmann La-Roche Inc.)

PHYSIOLOGY AND PATHOLOGY OF SLEEP SYMPOSIUM

PATHOLOGY OF SLEEP (Cont)

Thursday Morning 9-12 (Chairman: C. D. Clemente)

Selective and Total Sleep Deprivation

- 9:00 Physiological and Psychological Changes Following Total Sleep
 Deprivation
 L. C. JOHNSON
- 9:20 Partial and Differential Sleep Stage Deprivation
 W. F. WEBB
- 9:40 Biogenic Amines and Patterns of Sleep Stage Activity
 E.D. WEITZMAN
- 10:00 Coffee
- 10:20 The Functional Role of REM Sleep
 W. C. DEMENT
- 10:50 Sleep and REM as Biological Enigmas
 F. SNYDER
- 11:20-12:00 DISCUSSION - Panel

DRUGS AND SLEEP

Thursday Afternoon 2-5:00 (Chairman: I. Feinberg)

- 2:00 Neurophysiologic Classification of Psychoactive Drugs
 W. D. WINTERS
- 2:20 Stimulants, Drug Dependency and Sleep
 I. OSWALD

Treatment of Sleep Disturbances

- 2:50 Sedatives and Sleep-Dream Alterations
 A. KALES
- 3:10 Coffee
- 3:30 Antidepressants and Sleep: Clinical and Theoretical Implications
 E. HARTMANN
- 3:55 Clinical Evaluation of Hypnotics
 H. JICK
- 4:20-5:00 DISCUSSION - Panel

PHYSIOLOGY AND PATHOLOGY OF SLEEP

Symposium Participants

RALPH J. BERGER, PH.D.
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May 22-23, Century Plaza Hotel

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